

Docket No.: 50073-030



PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of : Customer Number: 20277
Yasuhiro MORII : Confirmation Number: 8907
Application No.: 09/588,478 : Group Art Unit: 2883
Filed: June 7, 2000 : Examiner: Timothy L. Rude
For: LIQUID CRYSTAL DISPLAY DEVICE AND PROCESS OF FABRICATING IT

TRANSMITTAL OF APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith is Appellant's Appeal Brief in support of the Notice of Appeal filed on January 31, 2005. Please charge the Appeal Brief fee of \$500.00 to Deposit Account 500417.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due under 37 C.F.R. §§ 1.17, 41.20, and in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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TABLE OF CONTENTS

	Page
I. REAL PARTY IN INTEREST.....	1
II. RELATED APPEALS AND INTERFERENCES.....	1
III. STATUS OF CLAIMS	2
IV. STATUS OF AMENDMENTS.....	2
V. SUMMARY OF CLAIMED SUBJECT MATTER.....	2
VI. ISSUES TO BE REVIEWED ON APPEAL.....	3
VII. ARGUMENT	4
VIII. CLAIMS APPENDIX.....	13

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APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Appeal Brief is submitted in support of the Notice of Appeal filed January 31, 2005,
wherein Appellant appealed from the Examiner's rejection of claims 15 and 16.

I. REAL PARTY IN INTEREST

This application is assigned to Kabushiki Kaisha Advanced Display, by assignment
recorded on September 27, 2000, at Reel 011205, Frame 0949.

II. RELATED APPEALS AND INTERFERENCES

Appellant is unaware of any related Appeal or Interference.

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III. STATUS OF CLAIMS

Claims 1-16 are pending in this Application of which claims 1-14 have been withdrawn from consideration pursuant to the provisions of 37 C.F.R. § 1.142(b). Claims 15 and 16 have been rejected multiple times, and it is from the multiple rejections of claims 15 and 16 that this Appeal is taken.

IV. STATUS OF AMENDMENTS

No Amendment has been filed subsequent to the issuance of the Final Office Action dated October 5, 2004.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claims 15 and 16 are the only examined independent claims. Each of claims 15 and 16 is directed to a process for fabricating a liquid crystal display in which all spacers except those on a projecting pattern are brought into contact by bonding only with the orientation controlling membrane of either a first substrate or a second substrate.

In a liquid crystal display, spacers and liquid crystals are located between a pair of upper and lower substrates. A problem associated with forming liquid crystal displays is that when a physical load or vibration is applied to the display, the spacers will move or be pressed against the upper and lower substrates. As a result, alignment layers on these substrates can become

damaged or scratched, and this damage causes liquid crystal orientation in the areas to become disordered, which causes problems such as light leakage, image contrast reduction and a rough surface appearance (paragraph spanning pages 5 and 6 of the specification).

The present invention addresses and solves this problem by fixing all of the spacers (except those on a projecting pattern) onto only the orientation controlling membrane of either a first substrate or a second substrate by bonding. Thus, even if some physical shock is applied to the liquid crystal display, the spacers do not move. As a result, light leakage and the problems associated therewith are reduced. (paragraph spanning pages 24 and 25).

VI. ISSUES TO BE REVIEWED ON APPEAL

1. Claims 15 and 16 were rejected under 35 U.S.C. § 103 for obviousness based upon Shimada et al., U.S. Patent No. 5,852,485 (hereinafter Shimada), in view of Yih, U.S. Patent No. 3,866,313, Suzuki, U.S. Patent No. 6,509,948, Utsumi et al., U.S. Patent No. 6,441,880 (hereinafter Utsumi), and Shigeta et al., U.S. Patent No. 6,266,121 (hereinafter Shigeta); and
2. Claims 15 and 16 were rejected under 35 U.S.C. § 103 for obviousness based upon Shimada in view of Yih, Suzuki, and Utsumi.

VII. ARGUMENT

THE REJECTION OF CLAIMS 15 AND 16 UNDER 35 U.S.C. § 103 FOR OBVIOUSNESS BASED UPON SHIMADA IN VIEW OF YIH, SUZUKI, UTSUMI, AND SHIGETA

For the convenience of the Honorable Board in addressing this rejection, Appellant notes that independent claims 15 and 16 stand or fall together with independent claim 15 being representative.

The Examiner's Statement of the Rejection

On page 6 of the Office Action dated October 5, 2004, the Examiner admitted that the primary reference of Shimada "does not explicitly disclose defining a gap between the first and second substrate by disposing a spacer, which is smaller than said gap, on a projecting pattern." The Examiner then referred specifically to Figs. 2A, 2B of Suzuki to teach this feature. On page 7 of the Office Action, the Examiner also stated the following with regard to the requisite motivation to modify Shimada in view of Suzuki:

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Shimada by defining a gap between the first and second substrate by disposing a spacer which is smaller than said gap, on a projecting pattern of Suzuki where spacers in the pixel regions remain uncompressed so the liquid crystal molecules will not be subject to anomalous orientation and light leakage will be avoided.

On page 8 of the Office Action, the Examiner also admitted that the primary reference of Shimada "does not explicitly disclose the step of bringing said spacer into contact with a first or second orientation controlling membrane using van der Waals bonding or hydrogen bonding." The Examiner then referred specifically to Fig. 29 of Shigeta to teach this feature. In the

paragraph spanning pages 9 and 10 of the Office Action, the Examiner stated the following with regard to the requisite motivation to modify Shimada in view of Shigeta:

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Shigeta with the alignment layer bonded to a spacer by hydrogen bonding of Shigeta to strongly bond with each other, thereby realizing a liquid crystal display element having a uniform cell thickness, high shock resistance, and a desirable displaying quality.

One Skilled in the Art Would Not Have Been Motivated to Modify Shimada in view of Suzuki to Arrive at the Claimed Invention

Claims 15 and 16 each recite the following limitation:

defining a gap between the first substrate and the second substrates by disposing a spacer, which is smaller than said gap and having a functional group on the surface thereof, on said projecting pattern.

As noted above, the Examiner relied upon Suzuki to teach this particular limitation. Appellant, however, submits that one having ordinary skill in the art would not have arrived at this claimed limitation based upon the combination of Shimada and Suzuki for the reasons stated by the Examiner. Specifically, Suzuki teaches away from the claimed invention.

As noted above, the Examiner's asserted benefit for the proposed modification is as follows:

by disposing a spacer which is smaller than said gap, on a projecting pattern of Suzuki where spacers in the pixel regions remain uncompressed so the liquid crystal molecules will not be subject to anomalous orientation and light leakage will be avoided.

This statement by the Examiner is, in certain respects, very similar to language found in column 7, lines 18-26 of Suzuki, which is reproduced below:

The reason for the above result is that, although spacers located at the color corner layers of the opposing substrate 2, that is, spacers located at the light shielding layer are held in a compressed and deformed state, the diameters of spacers located at the red layer are smaller than

the cell gap g, so that they are freely movable in the panel when a external force is applied to the panel. Thus, liquid crystal molecules around spacers will not be subjected to the anomalous orientation which causes the leakage of light. (emphasis added)

In comparing the Examiner's statement with the above citation from Suzuki, Appellant notes that both the Examiner and Suzuki discuss that the diameter of the spacer is smaller than the gap and the liquid crystal molecules will not be subject to anomalous orientation, which causes light leakage. The Examiner's statement, however, omits the language in Suzuki that the purpose of having spacers smaller than the cell gap is so that the spacers can move freely when an external force is applied to a panel.

This teaching of Suzuki, which is to have the spacers move freely, cannot be reconciled with the limitation found in each of claims 15 and 16, which recites "bringing all spacers disposed at parts other than said projecting pattern into contact only with the orientation controlling membrane of either the first substrate or the second substrate using [bonding]." If the spacers are freely movable and thereby not necessarily contacting a controlling membrane of either substrate, as advocated by Suzuki for the purpose of preventing light leakage, then all the spacers that are otherwise not disposed on the projecting pattern cannot necessarily be in contact only with the orientation controlling membranes, as claimed. Thus, one skilled in the art would not have arrived at the claimed invention based upon the teachings of Shimada modified by Suzuki since Suzuki teaches away from the claimed invention.

As noted above, the Examiner relied upon Shigeta to teach bring a spacer into contact with a first or second orientation controlling membrane using van der Waals bonding or hydrogen bonding, and the asserted benefits for this modification is "uniform cell thickness, high shock resistance, and a desirable displaying quality" (see pages 8-10 of the Office Action). However,

these asserted advantages are not a result of hydrogen bonding between the spacers 96 and the substrates 102, 104. Instead, these advantages are a result of the attachment of the spacers 96 to both substrates 102, 104 and the spacers 96 being formed from a resin material. This teaching by Shigeta, however, is away from the claimed invention, which recites that the spacers are disposed "only with the orientation controlling membrane of either the controlling membrane of the first substrate or the controlling membrane of the second substrate" (emphasis added). Thus, the claimed invention recites that spacers contact either one side or another, whereas Shigeta teaches away from the claimed invention by advocating that the spacers contact both sides.

The Examiner attempted to respond to this argument on pages 16 and 17 of the Office Action in the section entitled "Response to Arguments." Specifically, the Examiner asserted that "[i]t is respectfully pointed out that spacers small than the gap cannot contact more than [sic] substrates in region other than the projecting pattern." Assuming arguendo that this statement is correct, the Examiner has still failed to establish that all the spacers would inherently contact either one side or another. As taught by Suzuki (see, for example, Figs. 2A, 2B), the spacers need not contact any side/substrate, but instead, move freely between the substrates.

Appellant further notes that the asserted benefits for modifying Shimada in view of Shigeta and Suzuki are mutually exclusive. The asserted benefits of Suzuki are a result of the spacers moving freely, whereas the asserted benefits of Shigeta are a result of the spacers being bonded to both substrates (and thus being unable to move freely). Therefore, for the reasons stated above, Appellants submits that one having ordinary skill in the art would not have arrived at the claimed invention based upon the applied prior art.

THE REJECTION OF CLAIMS 15 AND 16 UNDER 35 U.S.C. § 103 FOR OBVIOUSNESS

BASED UPON SHIMADA IN VIEW OF YIH, SUZUKI, AND UTSUMI

For the convenience of the Honorable Board in addressing this rejection, Appellant notes that independent claims 15 and 16 stand or fall together with independent claim 15 being representative.

The Examiner's Statement of the Rejection

The Examiner's rejection based upon Shimada in view of Yih, Suzuki, and Utsumi is very similar to the prior rejection except the Examiner additionally applied Shigeta in the prior rejection. In the prior rejection, the Examiner relied upon Shigeta to teach bring a spacer into contact with a first or second orientation controlling membrane using van der Waals bonding or hydrogen bonding. Regarding this limitation, in the current rejection the Examiner stated on page 15 of the Office Action the following:

Utsumi teaches in Figures 1, 2, and 9, the use of long-chain alkyl group coated spacers (col. 10, lines 8-11) to improve contrast and viewing angle (col. 5, lines 36-40, col. 9 and Abstract). Please note that adding the long-chain alkyl group (functional group) of Utsumi will result in spacers being brought into contact with a first or second orientation controlling membrane using van der Waals bonding or hydrogen bonding per Applicant's enabling disclosure. This is not improper hindsight; Applicant has disclosed that the result of using such spacers is all that is required to achieve such bonding.

On page 13 of the Office Action, the Examiner also admitted that the primary reference of Shimada "does not explicitly disclose defining a gap between the first and second substrate by disposing a spacer, which is smaller than said gap, on a projecting pattern." The Examiner then referred specifically to Figs. 2A, 2B of Suzuki to teach this feature. On page 14 of the Office Action, the Examiner used identical language found on page 7 of the Office Action regarding the

prior rejection and stated the following with regard to the requisite motivation to modify

Shimada in view of Suzuki:

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Shimada by defining a gap between the first and second substrate by disposing a spacer which is smaller than said gap, on a projecting pattern of Suzuki where spacers in the pixel regions remain uncompressed so the liquid crystal molecules will not be subject to anomalous orientation and light leakage will be avoided.

Appellant's Response

The Examiner's rejection suffers from several fatal flaws. As noted immediately above, the Examiner modified Shimada in view of Suzuki for the stated benefit that "liquid crystal molecules will not be subject to anomalous orientation and light leakage will be avoided." As previously argued by Appellant, this benefit is a result of spacers moving freely, and this teaching cannot be reconciled with the limitation found in each of claims 15 and 16, which recites "bringing all spacers disposed at parts other than said projecting pattern into contact only with the orientation controlling membrane of either the first substrate or the second substrate using [bonding]." Therefore, one having ordinary skill in the art would not have been motivated to modify Shimada in view of Suzuki to arrive at the claimed invention.

The Examiner has also failed to establish that Utsumi inherently teaches "bringing all spacers disposed at parts other than said projecting pattern into contact only with the orientation controlling membrane of either the first substrate or the second substrate using [bonding]." Although the Examiner did not specifically invoke the doctrine of inherency, the Examiner did not assert that Utsumi explicitly teaches the missing limitation. Instead, the Examiner stated that "adding the long-chain alkyl group (functional group) of Utsumi will result in ..." (emphasis added). The Examiner also pointed to Appellant's disclosure to support this reasoning.

Appellant submits that the Examiner's implied reliance upon the doctrine of inherency to disclose the missing feature is misplaced. Inherency may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency.¹ To establish inherency, the extrinsic evidence must make clear that the missing element must necessarily be present in the thing described in the reference, and that the necessity of the feature's presence would be so recognized by persons of ordinary skill.² Appellant notes that the Examiner did not present any extrinsic evidence for support. Instead, the Examiner relied upon Appellant's disclosure. Thus, the Examiner has failed to establish that the inherency of the missing feature would have been recognized by one having ordinary skill in the art. Therefore, the Examiner has not established that modifying Shimada in view of Utsumi will inherently result "in spacers being brought into contact with a first or second orientation controlling membrane," as suggested by the Examiner.

Even if the Examiner's inherency argument is proper, the Examiner only stated that the inherent result is "spacers being brought into contact with a first or second orientation controlling membrane." The claims recite that all the spacers are disposed only with the orientation controlling membrane of either the first substrate or the second substrate, but the Examiner's

¹ In re Rijckaert, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993) (reversed rejection because inherency was based on what would result due to optimization of conditions, not what was necessarily present in the prior art); In re Oelrich, 666 F.2d 578, 212 USPQ 323, (CCPA 1981).

² Finnegan Corp. v. ITC, 180 F.3d 1354, 51 USPQ2d 1001 (Fed. Cir. 1999); In re Robertson, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999); Continental Can Co. USA v. Monsanto Co., 20 USPQ 2d 1746 (Fed. Cir. 1991); Ex parte Levy, 17 USPQ2d 1461 (BPAI 1990).

argument is completely silent with regard to this particular limitation.³ Instead, the Examiner only argued that modifying Shimada in view of Utsumi "will result in spacers being brought into contact with a first or second orientation controlling membrane." Such a presumed teaching, however, encompasses certain spacers contacting the first orientation controlling membrane at the same time other spacers contact the second orientation controlling membrane, which is not equivalent to that recited in the claimed invention. Therefore, notwithstanding the appropriateness or lack thereof of the Examiner's inherency argument, the Examiner has still failed to establish that the combination of the applied prior art teaches all of the claimed limitations since the Examiner has not identified a teaching in the applied prior art that discloses that all of the spacers contact either one controlling membrane or the other.

Conclusion

Based upon the foregoing, Appellants submit that the Examiner's rejections under 35 U.S.C. § 103 is not factually or legally viable. Appellants, therefore, solicit the Honorable Board to reverse the Examiner's rejection under 35 U.S.C. § 103.

To the extent necessary, a petition for an extension of time under 37 CFR § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper,

³ The Examiner made a similar error in the "*Response to Arguments*" on page 16 of the Office Action, in which the Examiner neglected to note that the limitation applies to all the spacers when the Examiner stated that Appellant only argued "Applied prior art does not teach bringing a spacer into contact with only one substrate."

Application No.: 09/588,478

including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP

A handwritten signature in black ink, appearing to read 'Scott D. Paul', written over a horizontal line.

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Date: March 29, 2005

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VIII. CLAIMS APPENDIX

15. A process for fabricating a liquid crystal display, comprising the steps of:

forming a first substrate including a scan signal line, an image signal line, and a plurality of electrodes;

forming a second substrate including a color filter, and a shading membrane;

forming a projecting pattern either at a position corresponding to the scan signal line on one face of the first substrate or at a position corresponding to the shading membrane on one face of the second substrate;

forming an orientation controlling membrane on a face of the first or second substrate on which said projecting pattern is formed;

disposing orientation controlling membranes on the first and second substrate so as to face each other;

defining a gap between the first substrate and the second substrates by

disposing a spacer, which is smaller than said gap and having a functional group on the surface thereof, on said projecting pattern, and

bringing all spacers disposed at parts other than said projecting pattern into contact only with the orientation controlling membrane of either the first substrate or the second substrate using van der Waals bonding or hydrogen bonding;

forming a panel of an in-plane switching type liquid display by joining said first substrate and said second substrate together with a sealant that is formed at an outer edge between the first and second substrates and a part thereof reaching ends of the first and second substrates to form an injection inlet for injecting liquid crystal;

disposing said panel in a liquid crystal injector in which a container filled with liquid crystal is disposed;

bringing back a pressure of said liquid crystal injector to atmospheric pressure while said injection opening being soaked into liquid crystal in said container, after evacuating air from said liquid crystal injector and said panel; and

sealing said injecting opening without any external pressure on said panel, after filling said panel with liquid crystal through said injection inlet utilizing pressure difference.

16. A process for fabricating a liquid crystal display, comprising the steps of:
 - forming a first substrate including a scan signal line, an image signal line, and a plurality of electrodes;
 - forming a second substrate including a color filter, and a shading membrane;
 - forming a projecting pattern either at a position corresponding to the scan signal line on one face of the first substrate or at a position corresponding to the shading membrane on one face of the second substrate;
 - forming an orientation controlling membrane on a face of the first or second substrate on which said projecting pattern is formed;
 - disposing orientation controlling membranes on the first and second substrate so as to face each other;
 - defining a gap between the first substrate and the second substrates by
 - disposing a spacer, which is smaller than said gap and having a functional group on the surface thereof, on said projecting pattern, and

bringing all spacers disposed at parts other than said projecting pattern into contact only with the orientation controlling membrane of either the first substrate or the second substrate using van der Waals bonding or hydrogen bonding;

forming a panel of an in-plane switching type liquid display by joining said first substrate and said second substrate together with a sealant that is formed at an outer edge between the first and second substrates and a part thereof reaching ends of the first and second substrates to form an injection inlet for injecting liquid crystal;

disposing said panel in a liquid crystal injector in which a container filled with liquid crystal is disposed;

bringing back a pressure of said liquid crystal injector to atmospheric pressure while said injection opening being soaked into liquid crystal in said container, after evacuating air from said liquid crystal injector and said panel; and

sealing said injecting opening after filling said panel with liquid crystal through said injection inlet utilizing pressure difference and leaving the pressure in said panel coming to be not less than -0.3 kgf/cm^2 with respect to the atmospheric pressure.